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FOREST PLANTING LEAFLET.

SCOTCH PINE (*Pinus sylvestris*).

FORM AND SIZE.

The Scotch pine closely resembles the red pine of North America. In Europe, in the region of its best development, it commonly attains a height of 120 feet and a diameter of from 3 to 5 feet. For a considerable distance above ground the stem is comparatively smooth and free from branches. In the forest the crown is short and compact, extending not more than one-third the length of the bole. The bark is usually deeply furrowed and, on the upper portion of the trunk, is distinctly reddish in color.

In portions of the Middle West planted trees of this species are often, entirely different in appearance from the usual form, being scrubby and distorted. This poor development is probably due not to unfavorable soil or climatic conditions, but to the use of some inferior variety or of seed from regions not well adapted to the growth of the tree.

RANGE.

In this country Scotch pine does not occur naturally. Abroad it is widely distributed, ranging throughout the greater part of Europe and through northern Asia southward to Asia Minor and Persia. In the region of its natural distribution extensive planting has greatly increased its occurrence, until at present it is probably the most important forest tree in Europe.

In the United States the Scotch pine can be planted over a wide area, including New England, the Middle and Lake States, the Dakotas, and especially the prairie States, such as Nebraska, Iowa, and Kansas. The ability of this tree to thrive in situations where the atmosphere is exceedingly dry admirably adapts it to the prairie States. Little commercial planting has been done in this country, although many small groves and isolated trees indicate its fitness to the regions named.

HABITS AND GROWTH.

The Scotch pine is quite indifferent to soil requirements. In Europe it grows on heavy, peaty soils, and from that extreme on all classes of soils to dry, sterile sand. Good growth depends upon the physical structure rather than upon the chemical composition of the soil. The best development is found on a deep, sandy loam containing considerable lime and underlaid by a fresh, well-drained subsoil.

In common with the moderate demands of the Scotch pine for mineral food is its extreme hardiness not only on dry, porous soils, but also in a dry climate.

The species is very intolerant of shade, in this respect exceeding all of our common trees, with the exception of the larches, aspen, and birch. It demands much more light than does the white pine. Notwithstanding this characteristic, moderately close planting is required to secure clear timber, for although the lateral branches are easily killed by shade they persist for a long time unless suppressed while young.

The rate of growth of this species in the United States is not well known. It is safe to say, however, that its growth is fairly rapid, planted groves in this country seeming to support the assertion that it equals that of our red pine.

In Europe the tree is subject to damage from a number of insects, but in America it appears free from injury. At present the general excellence of the tree will fully justify its wide use.

ECONOMIC USES.

In this country, except for fuel, no practical use has ever been made of the Scotch pine. Abroad it is the most important wood of commerce, furnishing the famous "red" and "yellow deals" of the British lumber trade. The wood is strong, close grained, highly resinous, and elastic, but not durable in contact with the soil. Despite this drawback, large quantities are used as cross-ties and pit props, its value for such uses often being increased by impregnation with wood preservatives to resist decay.

Small-sized material is widely used for staves, heading, box boards, etc., but the great use of the timber is for general construction purposes. Its strength and elasticity, together with the ease with which it is worked, adapt it admirably for carpentry of all sorts.

Although inferior in many respects to our white pine, the Scotch pine will form an excellent substitute, and its great hardiness commends it for wide planting in the United States. It is well suited for windbreaks and shelterbelts and has already been so used in the Middle West.

METHODS OF PROPAGATION.

The Scotch pine grows from seed, which it produces abundantly every two or three years; hence plantations must come from seedlings or from seed sown on the permanent site. Seed should be purchased abroad, preferably from Russia or Scandinavia, since experience has taught that trees grown from such seeds are, as a rule, hardier and produce timber of better quality than trees grown from seed collected in Germany.

Direct seeding is not usually successful; hence, in establishing the plantation, the use of nursery-grown seedlings is recommended. The nursery should be located on high, well-drained ground of moderate fertility. When thoroughly prepared, the ground should be laid out in seed beds 4 by 12 feet in size, separated by paths 18 inches wide.

Seed should be sown in drills 4 inches apart running across the bed. They should be sown thickly—25 to 30 per linear foot—and covered with no more than one-fourth of an inch of fine earth. In a pound there are nearly 75,000 seeds, or enough to plant 2,500 linear feet of seed rows, covering about 1,260 square feet of nursery space. At least 37,000 seedlings can be grown from 1 pound of seed. After planting, the entire surface of the bed should be "firmed." During the first season the young trees demand partial shade, such as is furnished by the common lath nursery screen. After this they require no protection from the full sunshine.

Seedlings may be left in the nursery from one to three years. If two or three year old stock is desired, the plants, to secure proper root development, should, when one year old, be transplanted into nursery rows. The transplanted trees should stand at intervals of 4 inches in rows 6 inches apart.

PLANTING.

Although for favorable situations younger plant material may be suitable, the use of three-year-old transplants is advised. At this age the young trees will have reached a height of from 9 to 12 inches and formed a vigorous root system capable of immediately establishing the tree.

In the plantation the trees may be spaced from 4 to 6 feet apart each way, depending upon the quality of the site. On somewhat unfavorable situations the closer planting is advisable, but usually planting 5 by 5 feet apart is best. To secure proper form development, the trees require considerable crowding while young; hence wide planting should never be practiced.

Scotch pine may be grown pure or mixed. It should never be associated with heavy-foliaged trees of equal or more rapid growth.

Suitable associates are European larch, Norway spruce, white pine, and red pine.

CULTIVATION AND CARE.

Except where there is a heavy sod growth, the Scotch pine requires no cultivation after planting. In the prairie country the younger trees should be cultivated until able to compete successfully against encroaching grasses. Stands should be fully protected against fire and trespass. Any insect damage should be reported and specimens sent to the Bureau of Entomology, Department of Agriculture, for information as to the nature of the pest and methods of control.

Approved.

JAMES WILSON,
Secretary.

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